

APPENDIX:

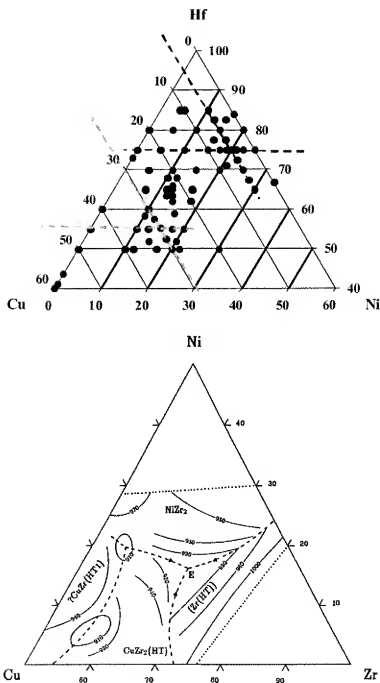


Figure 1. Locus of all experimentally fabricated alloys in Hf-Cu-Ni ternary composition space and the location of the eutectic (E) in the Zr-Cu-Ni system.

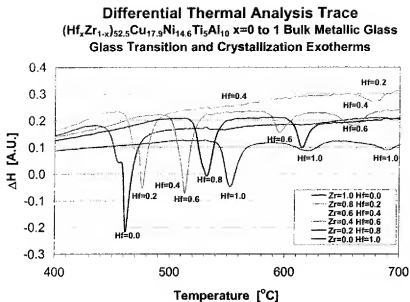


Figure 2. Crystallization events in the Hf-substituted Vitreloy 105 composition series, showing the increasing number of exotherms with decreasing Zr content.

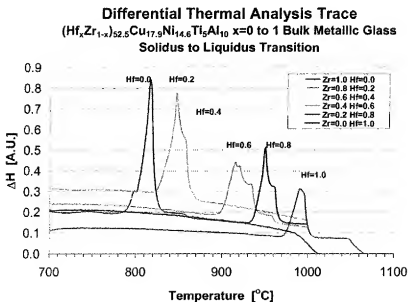
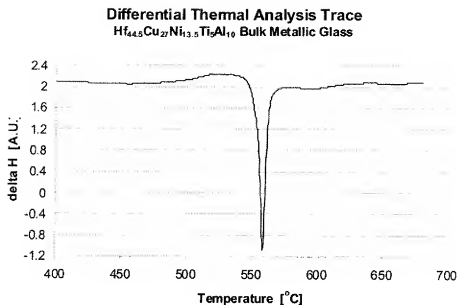


Figure 3. Solidus to liquidus transition in the Hf-substituted Vitreloy 105 composition series, showing the increasing differential melting of multiple crystalline species in each alloy; width of transition.

Table 1. Deviations from the ideal composition and their effect on T<sub>g</sub>.

Ingot #	Rod #	Composition (atomic %)	Liquidus (°C)	T <sub>g</sub> onset (°C)	T <sub>g</sub>
20503-6	020503-6SC	Hf47 Cu26 Ni13 Al10 Ti5	985	483	0.601
21203	21203-4	Hf44.5 Cu27 Ni13.5 Al10 Ti5	983	499	0.615
21903-3	21903-3-2	Hf46.75 Cu25.5 Ni12.75 Al10 Ti5	986 1024	485	0.602 0.584
21903-2	21903-2-1	Hf44.5 Cu27 Ni13.5 Al10 Ti5	984	494	0.610
42103-1	42103-1-1	Hf49 Cu24 Ni12 Al10 Nb5	1042	501	0.589
42103-2	42103-2-1	Hf44.5 Cu27 Ni13.5 Al10 Nb5	1036	507	0.596
61003-1	61003-2-1	Hf44.5 Cu29 Ni11.5 Al10 Ti5	1024	497	0.594
61003-1	61003-1-2	Hf44.5 Cu25 Ni15.5 Al10 Ti5	987	488	0.604
62003-1	62003-1-2	Hf46.5 Cu27 Ni11.5 Al10 Ti5	1005	(obscured) 481	(obscured) 0.591
62003-2	62003-2-1	Hf42.5 Cu27 Ni15.5 Al10 Ti5	1038 1040	(obscured) 513	(obscured) 0.599
62403-1	62403-1-1	Hf46.5 Cu25 Ni13.5 Al10 Ti5	987	501 496 498	0.611 0.610 0.612
62403-2	62403-2-1	Hf42.5 Cu29 Ni13.5 Al10 Ti5	1013	(obscured) 519	(obscured) 0.618
80103-2	80103-2-1	Hf39.5 Ti5 Nb5 Cu27 Ni13.5 Al10		No T <sub>g</sub>	

(a)



(b)

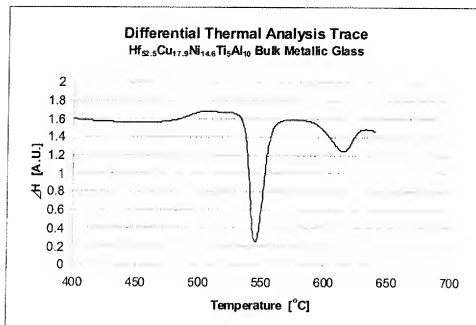
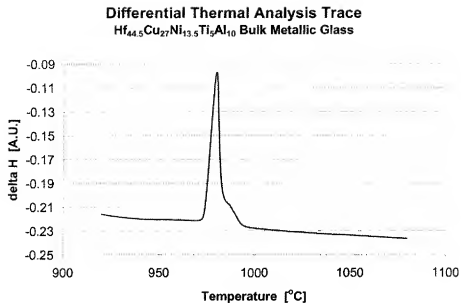


Figure 4. (a) crystallization event of the alloy claimed in the invention, showing a single exotherm. (b) crystallization events of the fully substituted Vitreloy 105 alloy, showing the first two exotherms. The third exotherm was not plotted for convenience.

(a)



(b)

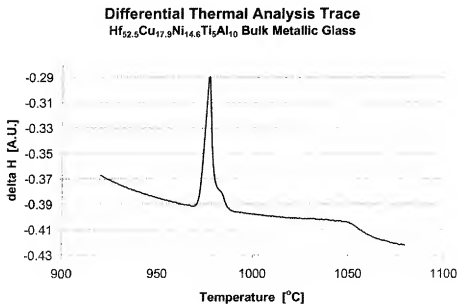


Figure 5. (a) solidus to liquidus transition of the alloy claimed in the invention, showing a narrow endotherm.  
(b) solidus to liquidus transition of the fully substituted Vitreloy 105 alloy, showing a significantly wider endotherm.